

Atlantic Richfield Company

Atlantic Richfield Company

4 Centerpointe Drive, 4-435
La Palma, CA 90623
Direct: (714) 228-6770

November 5, 2013

Mr. Steven Way
On-Scene Coordinator
Emergency Response Program (8EPR-SA)
US EPA Region 8
1595 Wynkoop Street
Denver, CO 80202-1129

Delivered via e-mail

**Subject: October 2013 Monthly Progress Report
Rico-Argentine Mine Site – Rico Tunnels
Operable Unit OU01, Rico, Colorado**

Dear Mr. Way,

This progress report describes activities conducted during the month of October 2013 at the Rico-Argentine Mine Site (site) and activities anticipated to occur during the upcoming month. These activities are organized by task as identified in the Removal Action Work Plan. This progress report is being submitted in accordance with Paragraph 35.a of the Unilateral Administrative Order for Removal Action (the "UAO"), dated March 17, 2011.

ACTIVITIES FOR OCTOBER

This section describes significant developments during the preceding period including actions performed and any problems encountered during this reporting period.

Site-Wide Activities

- Completed geotechnical soil borings and well installation throughout the site.

Task A – Pre-Design and Ongoing Site Monitoring

- Submitted and posted the Final June and July 2013 Surface Water and Ground Water Sampling and Flow Monitoring Reports and cross sectional transect data to the project SharePoint site. <https://www.aecomonline.net/projects/Rico>
- Preparing and reviewing August and September 2013 Surface Water and Ground Water Sampling and Flow Monitoring Reports prior to submittal to EPA and posting to the project SharePoint site.
- The October water sampling event was initiated on October 2, 2013 and completed October 9, 2013.
- October sampling event groundwater samples and water levels were obtained from the following groundwater wells: GW-1, GW-3, GW-4, GW-5, GW-6, GW-7, EB-1, EB-2, MW-101, MW-102, MW-103, MW-104, CHV-101S, P13-102, P13-103, MW-1 DEEP, MW-1 SHALLOW, MW-2 DEEP, MW-3 DEEP, MW-4 DEEP, MW-4 SHALLOW, MW-5 DEEP, MW-5 SHALLOW, MW-6 DEEP, MW-6 SHALLOW, and angle boreholes AT-2 and BAH-01. The following wells were found to be dry: MW-202, MW-2 SHALLOW, and MW-3 SHALLOW. A sample at MW-204 was not collected due to a subsurface break in the 2" PVC casing, not allowing a bailer to be lowered for sampling.

- During the October sampling event, surface water samples were collected from St. Louis Ponds locations DR-3, DR-4, DR-5 and DR-6.
- During the October sampling event, Dolores River water samples and flow measurements were collected from DR-1, DR-2, DR-7, DR-4-SW, and DR-G. Grab samples as well as multi-point composite samples were obtained from the referenced river locations with the exception of DR-G, from which only a grab sample was obtained.
- During October, flumes were inspected for debris. The flumes were cleared as required.
- Downloaded available flume data for October 2013 from the Parshall flume data loggers. The most recent data was obtained from the OTT PLS pressure transducer and ultra-sonic level sensor at north flume (DR-3) and from OTT Orpheus Mini at south flume (DR-6).
- Data from the pressure transducer located in angle borehole AT-2 was collected.
- Conducted inspection of the pond system spillways, pipes, water levels and general conditions. Overall condition of the pond system was good. All spillways and pipes were observed to be flowing without obstruction.
- Continued work on overall site Data Management System (EQuIS) development. A web-based system with site data which can be queried in a tabular format has been set up and is currently being tested and refined. A web-based system with site data which can be queried from a map is complete and being tested internally.
- Additional evaluation of potential improvements on field water data gathering and telemetry. Started preparation for solar panel and Doppler flow meter installation at DR-2 and DR-6 by installing conduit and solar panel support poles. Continued work on the antenna permit with the Town of Rico.
- Sonic drilling and angle hole drilling contractors continued drilling work.
- Completed 6 monitoring wells (DG-1D, DG-1S, DG-3, CHV-101M, CHV-101U, CHV-101-1D). Total drilled 347 ft. Conducted standard penetration tests on 2 borings. Began monitoring well development.
- Completed the surface calcine mapping for the engineering geological mapping task.
- COLOG completed downhole geophysical logging on 31 monitoring wells and recorded video on angle borehole AT-2.
- Weekly Storm Water Management Plan (SWMP) inspections were performed and maintenance conducted.

Task B – Management of Precipitation Solids in the Upper Settling Ponds

- St. Louis Adit discharge water continued to be diverted to Pond 15 during October 2013 to support dredging activity in Ponds 11 and 12. Pond 18 has not been in use during October.
- The St. Louis Pond system embankments flow and general conditions were inspected during October 2013. The ponds had adequate freeboard through the month. Flow into and between the ponds is not blocked and the overall condition of the embankments appeared good.
- Continued maintaining pond dikes as required throughout the project.
- Dredging completed in Pond 11 on October 7, 2013. Final estimated solids removed from Pond 11 will be determined from post-removal measurements of the pond compared to pre-removal measurements. Approximately 2 feet of solids remain in the bottom of Pond 11.
- Dredging of Pond 12 began on October 9, 2013 and completed on October 31, 2013. Final estimated solids removed from Pond 12 will be determined from post-removal measurements of the pond compared to pre-removal measurements. Approximately 2 feet of solids remain in the bottom of Pond 12.

Task C – Design and Construction of a Solids Repository

- Continued design of a phased solids repository at the South Stacked Repository – Option A (SSR-A) site.
- Continued work on geotechnical analyses of alternative solids drying facility and repository site, focusing current attention on Pond 13 and the SSR-A.



A BP affiliated company

- Continued evaluation of geotechnical field and laboratory test data on Pond 18 solids placed in the Interim Drying Facility (IDF) in 2011.
- Worked on establishing parameters for shear strength and consolidation testing of surrogate lime-amended treatment solids.
- Excavated, logged, and sampled 4 test pits near the hillside area south of the historical lime plant in the area of the proposed SSR-A.
- Continued preparation of the Dolores County Land Use Application and associated documents for a Certificate of Designation for the solids repository.
- Continued preparation of the Engineering Design and Operations Plan (ED&OP) for the Solids Repository for submittal to EPA and Dolores County for review by Colorado Department of Public Health and Environment. Met with CDPHE to discuss the project.
- Continued work to secure lands needed for a permanent solids repository. AR and its contractors are continuing preparation of the application for acquisition of this parcel through the Small Tracts Act.

Task D – Hydraulic Control Measures for the Collapsed Area of St. Louis Tunnel Adit

- The incline boring CHI 101 was started with the south drill pad shaped and the access road re-grading finished. The borehole was set at a 12.2 degree angle and drilled to 113 ft. Following removal of the drilling tools, the borehole was cased to 40 ft and capped for future work and access.
- Excavated, logged, and sampled 2 test pits near the collapsed adit area. Samples were shipped for geotechnical/physical properties analysis.
- Completed evaluation of six options to access a suitable location in the Hermosa Formation portion of the St. Louis Tunnel for hydraulic control. These include 1) a base case with continued drainage through the debris plug, plus monitoring wells to evaluate hydraulic head in the tunnel; 2) similar to the base case but with sub-horizontal relief wells to control hydraulic head behind the debris plug; 3) sub-horizontal well drains plus plugging of the debris plug; 4) construction of an interception wall immediately downstream of the debris plug to intercept mine water lost into the colluvium; 5) traditional tunneling; and 6) open-cut method with retaining walls to fully expose the intact rock portion of the tunnel.
- Evaluation of these options included, as necessary, contacts with directional drilling contractors to further identify and characterize potential issues with these technologies to penetrate the colluvium and colluvial debris blanketing the Hermosa Formation and blocking the St. Louis Tunnel at the end of the adit collapse area.
- Submitted the Adit and Portal Investigation Report and the Preliminary Design Report for the Hydraulic Control Measures for the collapsed area of the St. Louis Tunnel adit.

Task E – Source Water Investigations and Controls

- Performed stress-strain testing on the hoses used during the 2012 and 2013 517 Shaft injection tests to evaluate hose elongation. The 2012 and 2013 517 Shaft injection tests and interpretation of results will be included in a report to document Subtask E3 – Evaluation of Hydraulic Controls Alternatives.
- Continued Blaine Tunnel water depth and flow monitoring behind the Blaine Coffey Dam and Blaine Flume. Water level and flow data continued to be logged.

Task F – Water Treatment System Analysis and Design

- Continued pilot-scale wetland treatability study activities.
 - An inspection was performed on October 9, 2013.
 - Influent and effluent flow rates were measured to be approximately 3.5 gpm and 2.2 gpm, respectively.
 - Continued preparation of a report documenting constructed wetland pilot-scale testing activities, observations, and analytical results.
- Continued construction of the wetland demonstration.



A BP affiliated company

- Subgrade and Rough Grading – Excavation of the subgrade beneath the Subsurface Flow Wetland basin and removal of saturated unsuitable soils from beneath the Settling Basins and Surface Flow Wetlands. Calcine material and other unsuitable materials were removed to Drying Cell 3. Geotextile stabilization fabric (woven) was used to stabilize the subgrade prior to placement of engineered fill.
- Subsurface Flow Wetland – This area was graded and the subgrade completed. The embankments were constructed of engineered fill to the lines and grades contained in the approved drawings.
- Rock Drain and Aeration Channel – The embankments were shaped and compacted to the lines and grades contained in the approved drawings. Calcine and unsuitable subgrade material removed to drying cells 3 and 4 totaling 1,393 cy this period for a total of 6,642 cy.
- Pipeworks – The discharge collection boxes, piping, valves, and other designed appurtenances for the outfall of the aeration channel were completed. The piping, valves, flow meters, valve boxes, and Agri Drain for the outfall from the Rock Drain to Pond 18 were completed.
- Storm Sewer – The subgrade and necessary excavation was performed to install the storm drain structures (STMH—1, Inlet-2, STMH-3, and Inlet 4), the tie-in piping from existing area storm system, and the designed 24-inch CHDPE piping from STMH-1 to the Pond 18 outfall was completed. All lids and trash racks on Inlets 2 and 4 were installed. Placement of the outlet erosion protection rock was completed.
- Density testing was performed on placed engineered fill material for the wetland component subgrade, embankments and below structures. Testing was conducted on each lift and the appropriate documentation completed, detailing the results of testing. Placed materials met applicable specifications for compaction.
- Due to extreme rainfall experienced in September and the subsequent early onset of winter conditions at the site, Atlantic Richfield is suspending construction of the wetland demonstration. Field operations will be phased out over the next few weeks such that the wetland demonstration work completed to date will be stabilized, protected and ready for construction to resume in the spring. This delay will also provide the time needed to design a vertical flow component for the wetland which will be complementary to the horizontal flow portion and integrate it with the overall system design. Construction is anticipated to recommence by May 15, 2014.
- Prepared written responses to comments provided by the EPA on September 19, 2013, regarding the *St. Louis Tunnel Discharge Constructed Wetland Demonstration Treatability Study Work Plan*. Responses to comments were submitted to the EPA in conjunction with the *St. Louis Tunnel Discharge Constructed Wetland Demonstration Treatability Study Work Plan Revision 1* and the associated *Performance Monitoring Plan* on October 9, 2013.
- Continued preparation of a technical memorandum to summarize the results of the ion exchange bench-scale isotherm testing of the St. Louis Tunnel discharge (DR-3A) that was conducted in accordance with the *St. Louis Tunnel Discharge Ion Exchange Bench-Scale Treatability Study*.

ACTIVITIES FOR UPCOMING MONTH

This section describes developments expected to occur during the upcoming reporting period, including a schedule of work to be performed, anticipated problems and planned resolution of past or anticipated problems.

Site-Wide Activities

- As a result of the temporary suspension of the Demonstration Wetland construction for 2013, demobilization of project construction equipment and construction staff will be accomplished during November.
- Prepare Winter Operations Plan for water sampling and monitoring activities.



A BP affiliated company

- Review and finalize the draft avalanche hazard study report for the St. Louis Ponds Site and the Argentine Mill Site/Access Road.

Task A – Pre-Design and Ongoing Site Monitoring

- Complete drilling and well installation at DG-1D, DG-2D, DG-6D, DG-6S and PZ-1.
- Complete well development and well surface completions.
- Demobilize drilling equipment from the site.
- Complete, review, and post the August 2013 Surface Water and Ground Water Sampling and Flow Monitoring Reports to the project SharePoint site during November 2013.
<https://www.aecomonline.net/projects/Rico>
- Submit Preliminary September 2013 Surface Water and Ground Water sampling and flow data for the site.
- Review of the August, September, and October 2013 Surface Water and Ground Water Sampling and Flow Monitoring Reports.
- Conduct surface water and groundwater sampling/analyses and flow measurements per protocols contained in the SAP.
- Post surface water quality data to the SharePoint site after QA/QC review; and submit EQuIS data downloads to URS/EPA pending completion of EQuIS database.
- Download data from the Parshall flume data collectors and post to the project SharePoint site.
- Continue testing on the site Data Management System in preparation for system rollout.
- Complete monthly inspection of St. Louis Pond system. Perform detailed inspection of Pond 18 embankments and condition.
- Complete downhole geophysical logging on remaining new wells and inclined boring.

Task B – Management of Precipitation Solids in the Upper Settling Ponds

- Demobilization of dredging equipment.
- Complete clean-up of solids removal area and materials.
- Continue evaluation of calcine tailings/Pond 18 solids SPLP and associated geochemical testing.
- Continue monitoring and maintenance of the pond dikes as required.

Task C – Design and Construction of a Solids Repository

- Continue design of a phased solids repository at the SSR-A site.
- Continue geotechnical analyses and review to support design of a permanent drying facility and repository, including ongoing laboratory testing.
- Continue preparation of the Dolores County Land Use Application and ED&OP for a Certificate of Designation for the solids repository.
- Continue efforts to secure access to lands needed for a permanent drying facility and solids repository.

Task D – Hydraulic Control Measures for the Collapsed Area of St. Louis Tunnel Adit

- Monitor/download data from the transducer at drill hole AT-2.
- Continue evaluation of potential for in-mine storage of St. Louis Tunnel flows behind the planned bulkhead.
- Initiate detailed design for the hydraulic control measures for the collapsed area of the St. Louis Tunnel (adit).

Task E – Source Water Investigations and Controls

- Continue preparation of a report to document Subtask E3 – Evaluation of Hydraulic Controls Alternatives. The report will be submitted to the EPA by December 31, 2013.
- Continue Blaine Tunnel water depth and flow monitoring behind the Blaine Coffey Dam and Blaine Flume.



A BP affiliated company

Task F – Water Treatment System Analysis and Design

- Continue pilot-scale wetland treatability study activities.
 - Finalize the report documenting constructed wetland pilot-scale testing activities, observations, and analytical results. The report will be submitted to the EPA by November 4, 2013.
 - Maintain flow through the pilot-scale wetland until the matrix materials from the rock drain and wetland cell are used as inocula for the wetland demonstration rock drain and SSF wetland.
- Continue wetland demonstration treatability study activities.
 - Protection of the completed Demonstration Wetland construction.
 - Storage of purchased materials for use in 2014 Demonstration Wetland construction.
 - Demobilization of Demonstration Wetland construction equipment and staff.
 - As noted previously, construction of the wetland demonstration was suspended until spring 2014. Field operations will be phased out over the next few weeks to stabilize and protect completed work. Construction is anticipated to recommence by May 15, 2014.
 - Continue review and planning activities for implementation of the wetland demonstration design, including the addition of a vertical flow wetland component. A revised design incorporating a vertical flow wetland will be submitted to the EPA by December 31, 2013.
- Continue scoping additional data needs as necessary related to treatment system alternatives.

If you have any questions, please feel free to contact me at (951) 265-4277.

Sincerely,



Anthony R. Brown
Project Manager
Atlantic Richfield Company

cc: R. Halsey, Atlantic Richfield
T. Moore, Atlantic Richfield
C. Sanchez, Anderson Engineering
D. McCarthy, Copper Environmental Consulting
T. Kreutz, AECOM
D. Yadon, AECOM
J. Decker, AECOM
J. Christner, Weston Solutions, Inc.
S. Riese, EnSci
A. Cohen, Esq., Davis Graham & Stubbs
W. Duffy, Esq., Davis Graham & Stubbs
S. D'Cruz, Esq., Atlantic Richfield
A. Piggott, Esq., U.S. EPA
M. Lombardi, AMEC
S. Archer, AMEC

file: Atlantic Richfield Rico Archives, La Palma, CA
AECOM Denver Project File



A BP affiliated company